The relationship between debt and a firm's performance: the impact of institutional factors

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Brief biographical note

Miguel Tavares was born at the 18th of February, 1993 in the city of Braga. In 2011 started studying in Porto Economics faculty finishing the bachelor in Economics in 2014. In September of the same year started the master in management in the same faculty with the objective of consolidating previously learned skills and focusing on deepening knowledge in management.

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Abstract

The effects of debt on firms' performance have drawn much attention from researchers in that it is a crucial issue for managers. It is essential to understand debt and its relationship with firm's performance so managers can assess financial needs, borrowing capacity and the ability to have profits and maximize performance. The relationship between debt and a firm's performance has been studied from different perspectives. However, empirical studies have shown ambiguous results. In this way, this work aims at contributing to the extant literature, by focusing on the influence of the institutional framework on the relationship between debt and performance. It is a poorly studied factor since most studies focus only on the relationship between debt and firms' performance in one country. Therefore, this study has the purpose of filling a research gap bringing new empirical evidence to this matter, based on a large sample of 48,840 manufacturing firms from nine European countries for the 2008-2013 period and using multivariable methods. Results show that the impact of debt on a firm's performance depends on the measure of debt (short term debt positively affects a firm's performance while long term debt presents a negative relationship) and that the institutional framework is indeed affecting the relationship between debt and firm's performance.

Key-words: Debt, Leverage, Firm performance, Profitability, Europe, Institutional framework

JEL-Codes: G32, L25

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List of abbreviations

EBITDA:	Earnings before interests, taxes, depreciations and amortizations
EPS:	Earnings per share
EVA:	Economic value added
MVA:	Market value added
MTBV:	Market to book value
ROA:	Return on assets
ROE:	Return on equity
ROI:	Return on investment
ROS:	Return on sales

1. Introduction

The effects of debt on firms' performance are a relevant theme to managers for a long time. As referred by Weill (2008), the relationship between debt and firm performance has been studied from different theoretical perspectives, from Modigliani and Miller (1958) to the agency cost theory (Jensen and Meckling, 1976; Myers, 1977), the trade-off theory (Scott, 1977) and the pecking order theory (Myers and Majlufís, 1984).

As stated by Weill (2008, p.253) "*theoretical literature provides opposing arguments with respect to the relationship between leverage and corporate performance*". Furthermore there are a vast number of studies relating financial leverage and a firm's performance also with ambiguous results (Yazdanfar and Ohmar, 2015). For instance, while Zeitun and Saleh (2015), studying 400 firms from countries of the Gulf Cooperation Council (GCC) over the 2004-2012 period, concluded that debt negatively affects firm performance, Abor (2005) testing the relationship among 22 listed firms in the Ghana stock exchange market over the 1998-2002 period obtained the opposite results suggesting that short-term debt positively influences firm profitability. Weill (2008), focusing his study on firms from seven European countries over the 1998-2000 period also obtained divergent results: the author found a positive relationship for Belgium, France, Germany and Norway, a negative relationship for Italy and Spain, and not statistically significant for Portugal.

Weill (2008) reports that empirical studies usually focus only on one country and suggests that the different results evidenced in the empirical literature may derive from the fact that the institutional framework may have an effect on the relationship. Weill (2008) studied this question by dividing the institutional framework into two major institutional factors: "the access to bank credit for firms" and "the attributes of the legal system". Weill's findings show that the divergent results from country to country are influenced by the two institutional factors referred. However, as it was stated by the author, more research is needed with more data including a larger number of countries and over a longer period of time. In this way, the aim of this work is to contribute to the extant literature with the main objective of clarifying the

relationship between debt and firm's performance. More specifically, the present work aims to answer the following research question:

Does the institutional framework affect the relationship between debt and a firm's performance?

This study has the purpose of filling a research gap created by ambiguous results but it is also relevant for companies and entrepreneurs, since as highlighted by Zeitun and Saleh (2015) a better understanding on debt and its relationship with firm's performance can assist them assessing financial needs, borrowing capacity and consequent ability to achieve profits and maximize performance. Actually firms' managers who are able to plan their debt policy are more likely than other managers to reduce the firm's cost of capital increasing profitability thereby improving its performance (Yazdanfar and Ohman, 2015).

In order to answer the research question we will focus on a sample of firms from nine European countries (Belgium, Finland, France, Germany, Greece, Italy, Portugal, Spain and Sweden) over the 2008-2013 period. In this way this study will cover more countries and a longer period of time when compared to Weill (2008), trying to add new empirical evidence to this matter.

After this section, this report is structured as follows: in Section 2, a literature review of the topic is presented, which includes the relevant definitions for the theme (Section 2.1), the main theories that explain the relationship between debt and firm performance (Section 2.2), a survey of empirical studies about this relationship (Section 2.3), and finally, a critical analyses of the literature reviewed (Section 2.4). Section 3 presents the methodology, which includes the phases of the study (Section 3.1), model specification (Section 3.2), data sources and characterization of the sample (Section 3.3) and a descriptive analysis of the variables (Section 3.4). Section 4 presents the empirical results of the present study which includes a correlation analysis (Section 4.1), the model estimation and analysis by country (Section 4.2) and the role of institutional factors (Section 4.3). Finally Section 5 presents the main conclusions, limitations and suggestions for future studies.

2. Literature Review

This chapter discusses relevant definitions and studies for the theme. Section 2.1 presents the relevant concepts of performance and debt followed by section 2.2 presenting relevant theories justifying optimal capital structures (e.g. Modigliani and Miller, Agency Theory, Trade-off Theory and Pecking-order theory). Finally, section 2.3 focuses on reviewing a number of empirical studies on the influence of debt on firm performance followed by section 2.4 which presents a critical analysis of the literature reviewed.

2.1 Concepts

2.1.1. Firm performance

According to Chakravarthy (1986), as cited in Santos and Brito (2012, p.100), "financial performance is a way to satisfy investors" and can be represented by more than one indicator. Usually financial performance measures are divided into three major indicators categories: profitability, growth and market value, as shown in Table 1. Table 1 also presents the most used measures of each category.

Table 1: Categories of performance measures

Profitability	Growth	Market value
Return on Assets	Sales Growth	Stock price improvement
Return on Sales	Asset Growth	Dividend yield
Return on Investment	Net revenue growth	Stock price volatility
EBITDA Margin	Net income growth	Market value added
Return on Equity		Tobin's Q
Economic Value added		Market-to-book value
Earnings per share		

Source: Own elaboration based on Venkatraman and Ramanujam (1986), Cho and Pucik (2005), and Al-Matari, Al-Swidi and Fadzil (2014)

According to Cho and Pucik (2005) and Venkatraman and Ramanujam (1986), profitability is the past firm ability to generate returns and can be measured through

several ratios directly related to the company's accounting: return on assets (ROA), expressed by the ratio of net income over total assets; return on sales (ROS) or profit margin, corresponding to the ratio of net income over sales; EBITDA margin calculated by dividing firm's earnings before interests, taxes, depreciation and amortization (EBITDA) by its revenues; return on investment (ROI), defined by the ratio between the gains from investment minus the cost of investment over cost of investment; return on equity (ROE), defined by the ratio of Net income over shareholder's equity; economic value added (EVA) calculated by subtracting the cost of capital to the net operating profit after taxes. Finally, as a last indicator, earnings per share (EPS) obtained by the ratio of net income minus dividends on preferred stock over average outstanding shares (Cho and Pucik, 2005; Venkatraman and Ramanujam, 1986).

Growth is the past firm ability to increase its size and can be assessed by several indicators in order to study the firm temporal performance from on year to another with respect to several variables, such as sales, assets, net revenue, net income (Cho and Pucik, 2005; Venkatraman and Ramanujam, 1986).

Market value represents the expected value by the market considering the future performance of the firm and bringing a future temporal perspective to performance (Cho and Pucik, 2005; Venkatraman and Ramanujam, 1986). The presented measures are stock price improvement, dividend yield (ratio of annual dividends per share over price per share), stock price volatility, market value added (MVA) (company's market value minus invested capital), Tobin's Q (obtained by the ratio of total market value over total asset value) and market-to-book value (MTBV), calculated by dividing the market capitalization by the total market value (Cho and Pucik, 2005; Venkatraman and Ramanujam, 1986).

Accounting measures, such as ROA, ROE, ROI, among others, have the disadvantage of looking to the past, being better suited as short-term performance measures and are often limited by accounting standards, while market-based measures (Tobin-Q, Market Value Added, Market-to-Book Value, among others) look to the future, giving information for long term-performance (Al-Matari et al., 2014).

Despite the disadvantages of accounting based performance measures these are

easier to get and are more frequently used, as suggested by Al-Matari et al. (2014) who identified the most used performance measures in 286 empirical studies published between 2003 and 2012. According to this study, accounting based performance measures were used in 191 studies and the most used measures were: ROA (88 studies), ROE (52 studies), EBITDA margin (15 studies), ROS (9 studies) and earnings per share (EPS) (9 studies). Furthermore, market-based performance measures were used in 95 studies: Tobin-Q was used in the majority of the studies (74 studies) while the second most used measure was market to book value (MTBV) (6 studies). Note that this study refers sales growth as the only growth measure which was used only in 3 studies.

2.1.2. Debt

The second relevant definition is debt as a component of the capital structure. According to Abor (2005), capital structure is a mix of different securities but mostly the capital structure is divided in internal financing (equity, retained earnings, among others) and external financing (Debt). This second component of the capital structure is the most relevant here since the objective of this work is to study the relationship between debt and firm performance.

Previous literature suggests that the legal and financial environment of a country influences the access to external financing (La Porta, Lopez-De-Silanes, Shleifer and Vishny, 1998). This means that in countries with weak legal and financial systems firms have more difficulty in obtaining external financing, which results in fewer opportunities to invest and consequently affects a firm's performance (La Porta et al., 1998).

Debt can be divided into three types according to Abor (2007): short term debt, long term debt and trade credit. Usually debt it is measured with different indicators based on ratios of debt in order to compare debt to the size of the company, such as debt/equity or debt/assets, and each one of these indicators can resort to different types of debt (e.g. short term debt/Equity, long term debt/equity, etc.).

2.2 The relationship between debt and firm performance: theoretical analysis

2.2.1. Capital structure theories

According to Weill (2008) the relationship between debt and firm performance can be explained using the perspective of Modigliani and Miller, the agency theory, the trade-off theory and the pecking order theory. Table 2 presents a summary of the different theories.

Table 2: Theoretical approaches

Theory/Author	Impact of debt on firm Performance	Mechanism
Modigliani and Miller (1958)	Irrelevant	-
Modigliani and Miller (1963)	Positive	Tax saving benefits due to debt interests
Agency Theory Jensen and Meckling (1976) and Myers (1977)	Negative	Conflicts between shareholders and debtholders
	Positive	Conflicts between shareholders and managers
Trade-off Theory Scott (1977); Miller (1977)	Positive effect until optimal value, negative effect afterwards	Tax benefits vs cost of financial distress
Pecking-order theory Myers and Majluf (1984)	Negative	Internal financing as the preferred method, followed by debt and external equity financing

Source: Own elaboration

To start this analysis is important to refer the perspective of Modigliani and Miller (1958) as the first theory on capital structure stating that in a perfect capital market the capital structure has no effect on firm value. This theory is based on some unrealistic assumptions that makes it not applicable in the real world, namely that no taxes or transaction costs exist, all investors have similar opportunities in the financial markets with similar costs, there is no information asymmetry, no bankruptcy costs and no effect of debt on company's earnings (El-Chaarani, 2015). As Modigliani and Miller (1958) refer this was a "static, partial equilibrium analysis".

Giving a different perspective Modigliani and Miller (1963) improved their previous study by considering the effect of tax savings directly related to debt financing. The results suggest a positive correlation between leverage and a firm's

performance due to the positive effects of tax savings since interest payments will be deducted to the EBITDA lowering the amount of taxable results.

The agency theory, developed by Jensen and Meckling (1976) and Myers (1977) advocates that conflicts between shareholders and debtholders in companies with higher leverage levels generate higher agency costs which lower firm's performance. These conflicts come from the fact that shareholders have incentives to invest in riskier projects since possible losses are shared between debtholders and shareholders. In this way, this theory supports the negative effects of debt on a firm's performance. This theory is assumed to be applicable to both large and small businesses (Chittenden, Hall, and Hutchinson, 1996; Myers 2001) and it is assumed that firms with an higher level of equity capital, have lower agency costs related with conflicts between shareholders and debtholders increasing its performance (Casey and Anderson, 1997; Ooi, 2000). Also owners of firms with higher levels of debt risk losing their property and losing control over their firms (Holmes and Kent, 1991; Hamilton and Fox, 1998). According to Fama and French (2002), excessive levels of debt lead to higher agency costs, which imply a negative relation between the debt ratio and a firm's performance. All these authors defend lower levels of debt in order to maximize performance.

Agency theory also has a different perspective supporting positive effects of debt on firm performance coming from the conflicts between shareholders and managers (Weill, 2008). This type of conflicts is due to the "moral hazard" problem from managers who have their own objectives that may not be the best for the value of the firm (Weill, 2008; El-Chaarani, 2015). In this conflict debt financing is a solution by putting a burden on managers' actions through interest payment obligations and consequent free cash flow reduction, which limits the freedom to use company's cash-flow. In this way debt generates pressure on managers by limiting their actions and pressuring them to perform well and to generate cash flow in order to pay the debt service. As a result firm's performance increases as well as the firm's value (Jensen, 1986; El-Chaarani, 2015).

The trade-off theory is another theory justifying a positive association between debt and a firm's performance by comparing tax benefits of debt and bankruptcy costs. As debt increases, the marginal benefit resulting from further increases in debt

decreases and the marginal cost increases (Scott, 1977). In conclusion this theory defends a positive relationship between debt and firm performance until the equilibrium point where the cost of financial distress equals the benefits of tax savings. In this way if a company wants to optimize its value it should focus on this trade-off between the cost of financial distress and the benefits of tax savings when choosing between the amount of debt and equity to use and will not go further than this equilibrium point since further increases in debt will reduce firm value (Scott, 1977; Miller, 1977).

As a last theory on Capital structure the pecking order theory presented by Myers and Majluf (1984) does not justify a positive or negative relationship between debt and firm performance but, instead, focuses on asymmetrical information costs to justify companies options between internal and external financing. Managers know more about their firms than investors which make companies prioritize their financing strategy based on the cost of financing (Myers and Majluf, 1984). This mechanism leads companies to use internal financing as the preferred method since it is the less costly method, followed by debt, signalling confidence that an investment is profitable, and external equity financing as a last resort (Myers and Majluf, 1984). For these authors there is a "pecking order" as a hierarchy in firm financing and not a balanced approach as the result of the trade-off theory presented before. Following the previous argument is possible to say that internal financing is less costly than debt financing which might indicate a negative correlation between debt and a firm's performance, mostly in investments that turn to be less profitable than expected and presenting lower rates of return when compared with the cost of financing (Myers and Majluf, 1984; Abor, 2005).

After the presentation of the relevant theories on the effects of debt on a firm's performance it is important to state that these theories are based on assumptions which are difficult to verify in reality. With this in mind and following Weill's (2008) approach it is important to study the institutional framework of each country as a possible moderating factor in the relationship between debt and a firm's performance. This factor will allow the introduction of individual characteristics of each country on the analysis and in that way try to explain the divergent results presented by the theory.

2.2.2. The Institutional Framework

A last point in focus is the institutional framework, as the set of laws, regulations, procedures, and norms affecting socioeconomic activity (Weill, 2008) and more specifically the institutional factors affecting the relationship between debt and a firm's performance. According to Weill (2008) we have two main factors, as reported in Table 3.

Table 3: Institutional factors

Institutional factors	**Measures**
"Access to bank credit" for firms	The ratio of "claims of deposit banks on private sector GDP"
Attributes of the legal system	Protection of creditor rights index Protection of shareholders rights index "Efficiency of the legal system" index

Source: Own elaboration, based on Weill (2008)

The first factor is the "access to bank credit" for firms, since according to Corbett and Jenkinson (1994), as cited in Weill (2008), European small and medium size enterprises (SMEs) rely on debt financing to keep operating. This first factor was defined by Weill "as the ratio of claims of deposit banks on private sector GDP" and according to the author it can influence the relationship between debt and a firm's performance through "the signaling argument". According to this argument, companies issue debt in order to give signs to the market showing that they can support interest payments. In this way, the conclusion is that in countries where the "access to bank credit" for firms is lower the signaling argument will also pay a minor role (Weill, 2008).

The second factor to consider is the attributes of the legal system which are divided into three main indexes provided by La Porta et al. (1998), as cited in Weill (2008): first an index to measure the "protection of creditor rights"; second the protection of shareholder rights (these two indexes are the norm to assess investor protection); and as the last index is the "rule of law" dealing with "efficiency of the legal system to assess the enforcement of the rights". This last index is supplied by

private credit risk agencies (Weill, 2008). The main argument used by Weill (2008) is that changes in rights, both to shareholders and creditors, affect two of the arguments about the relationship between debt and performance. On the one hand, if shareholders' rights increase it enhances their power against managers and the role of the "free-cash flow argument" decreases. On the other hand, if creditor's rights increase it will "*help to reduce moral hazard problems*" of shareholders taking riskier investments. These two factors are directly affecting the Agency theory mechanisms justifying their use in the analysis. Finally, and according to Weill (2008), if the third index ("efficiency of the legal system") is improved "the protection of creditor and shareholder rights" is improved and consequently both the "free cash flow argument" (positive impact on performance) and "moral hazard problems" (negative impact on performance) mechanisms are affected, as mentioned above. Nevertheless it is assumed that the greater impact of the third index is the reduction of moral hazard problems through increase in creditor's rights since most countries in this analysis are bank-oriented financial systems (Demirguc-Kunt and Levine, 2000).

Gonzalez (2013) also focus on the institutional framework by dividing countries in 4 groups with similar institutional characteristics, namely "*English origin, French origin, German origin, and Scandinavian origin countries*". Results showed that the impact of leverage on a firm's performance is affected by the legal origin of each country. This conclusion was directly related with French legal origin countries where financial distress costs outweigh the benefits of the disciplinary role of debt. This analysis of Gonzalez (2013) uses the "*protection of shareholder rights and the strength of legal enforcement*" as the main variables explaining the institutional framework and the effects on the relationship between debt and a firm's performance through its effects on agency conflicts following a similar approach to Weill (2008).

The analysis of Weill (2008) and Gonzalez (2013) suggest that the institutional framework of each country can have a significant impact on the theoretical arguments and in the divergent results from previous empirical studies. In this way, it is essential to continue the research on the relationship between debt and a firm's performance focusing on the impact of the institutional framework in order to deepen this issue.

2.3.Empirical studies on the effect of debt on firm performance

Several empirical studies have been studying the impact of debt on a firm's performance. Table 4 summarizes fourteen studies chronologically ordered, focusing on the country analysed, sample, period, method, proxies for performance and debt and the main results. The present studies were selected through searching on Web of science and SCOPUS databases in January of 2016, using the key words "Leverage", "Debt" or "Capital structure" and "Corporate performance", "firm performance" or "firm profitability" in order to reach the most relevant studies. To complement this research and found studies related with European companies there were also used the terms "Europe" and "European firms". This search allowed reaching ten studies: Abor (2005), Abor (2007), Weill (2008), Ebaid (2009), Salim and Yadav (2012), Gonzalez (2013), Yazdanfar and Ohmar (2015), Zeitun and Saleh (2015), El-Chaarani (2015) and Tsuruta (2015). The remaining studies were selected by their references with attention to the date of publication in order to have the most recent references.

Table 4: Summary of empirical studies on the effect of debt on firm's performance

Author (year)	**Country**	**Sample (firms)**	**Period**	**Method**	**Proxies for performance**	**Proxies for debt**	**Result**
Majumbar and Chhibber (1999)	India	1,043	1988-1994	Weighted least squares estimation	Profit/sales (%) Return on net worth	Total debt to equity ratio	-
Simerly and Li (2000)	US	700	1989-1993	Multiple regression model	ROA ROI	Total debt to equity ratio	+/-
Abor (2005)	Ghana	22	1998-2002	Panel Data OLS	ROE	Short-term/ long-term/total debt to total capital ratio	+/-
Abor (2007)	Ghana; South Africa	360	1998-2003	Panel Data GLS	Gross profit margin ROE Tobin's Q	Short-term/ long-term/total debt to total capital ratio	+/-
Weill (2008)	Belgium; France; Germany; Norway; Italy;Spain; Portugal	11,836	1998-2000	One-stage procedure; The cost efficiency model	Frontier efficiency scores	Total liabilities to total assets ratio	+/-/0

Table 4 (*cont.*)

Ebaid (2009)	Egypt	64	1997-2005	Multiple regression analysis; OLS	ROE ROA Gross profit Margin	Short-term/long-term/total debt to total assets ratio	0/-
Salim and Yadav (2012)	Malaysia	237	1995-2011	OLS	ROA ROE EPS Tobin's Q	Short term debt long term debt; total debt	+/-
Gonzalez (2013)	39 countries	10,375	1995-2004	GMM	Ratio of EBITDA over Assets	Book value of total debt to book value of total assets ratio	+/-
Olokoyo, (2013)	Nigeria	101	2003-2007	Panel Data analysis	ROA ROE Tobin's Q	Short-term/long-term/total debt to total assets ratio	+/-
Akem et al (2014)	Nigeria	173	2002-2012	Descriptive, correlation and regression technique	ROI ROA	Total/long-term debt to equity ratio; Total debt	-
Yazdanfar and Ohmar (2015)	Sweden	15,897	2009-2012	3SLS; fixed-effects models	ROA	Short term/ long term debt to assets ratio	-
Zeitun and Saleh (2015)	Gulf Cooperation Council countries	400	2004-2012	Dynamic GMM	ROA Tobin's Q	Total debt to total assets ratio	-
El-Chaarani (2015)	France; Italy; Spain; Germany; Austria; Switzerland UK; Ireland	5,050	2012	Descriptive, correlation and regression technique	Tobin's Q	Total debt to total assets ratio	+/-
Tsuruta (2015)	Japan	90,036	1996-2006	Panel Data OLS	Operating income to total assets ratio; growth rate of sales	Short-term borrowings growth: trade payables growth; trade receivables; bill discount	+

Legend: +/-/0 represent, respectively, a positive, negative or not statistically significant relationship; OLS – Ordinary least squares; GLS – Generalized least squares; GMM - Generalised Method of Moments; 3SLS – three stage least squares

Source: Own elaboration

As it is visible in table 4 results diverge when talking about the relationship between debt and a firm's performance and there is no exact answer for the question

"Is the relationship between debt and firm performance positive or negative?". Some of these studies have small samples and focus only on one country which might affect the results. Variables used in these studies can also justify these differences since, as explained before there are multiple ways to measure performance and debt.

Performance is considered as the dependent variable and the most commonly measures are ROA, ROE and ROI which is consistent with the results of Al-Matari et al. (2014) mentioned in section 2.1.1. As the main independent variables in these studies debt proxies are used, usually related with ratios of debt (total, short term and long term) to capital or assets. Control variables are also used in order to assess the relationship between debt and a firm's performance. Firm size measures are commonly used being present in most empirical studies reviewed, as well as growth and firm age.

Majumdar and Chhibber (1999) investigated the relationship between debt and a firm's performance based on a sample of 1,043 Indian firms from several industry sectors during the 1988-1994 period. The results revealed a negative relationship between the debt ratio and a firm's performance measured by the profit over sales ratio and return on net worth. These authors suggested an important impact of the specific case of India financial institutions since those are state-owned which may take a significant impact on the relationship between debt and firm performance.

Simerly and Li (2000) based their analysis on a sample of 700 large US firms from several industry sectors over the 1989-1993 period, examining the "joint effect of competitive environments and capital structure on economic performance." (Simerly and Li, 2000, p.31). Results suggested that the impact of financial leverage can be positive in the case of a stable environment and negative in a dynamic business environment. This is justified by the fact that in dynamic business environments debt limits the strategic choice of managers.

Abor (2005) tested the relationship among 22 listed firms in Ghana over the 1998-2002 period having found a positive relationship between the short-term debt to total assets ratio and ROE but a negative impact of the long-term debt to total assets ratio on ROE was found. The results also showed a positive relationship between the total debt to total assets ratio and ROE, which may result from the greater effect of

short-term debt mentioned above. This study is characterized by a very small sample.

Two years later Abor (2007) studied a sample of 160 Ghanaian and 200 South African SMEs over the 1998-2003 period. According to the results, short term debt is positively related to firms' performance and long-term debt is negatively related to the firms' performance like the results of his previous study. However, total debt presents a negative relationship with the firms' performance thus obtaining opposite results to the previous study, which can be justified by a number of different factors, from the larger sample to the inclusion of another country.

Weill (2008) analysed the effect of financial leverage on the performance of 11,836 manufacturing firms operating in seven European countries over the 1998-2000 period, which might be considered a small period of time. The results obtained by Weill (2008) indicate that the effect of debt on a firm's performance varies from country to country: financial leverage has a positive effect on a firm's performance in Spain and Italy, but is negatively related to a firm's performance in Germany, France, Belgium and Norway; In the case of Portugal results obtained are not statistically significant. Weill (2008) added a different perspective to his work by considering the role of the institutional framework of each country. To explore this aspect Weill included two new factors in his analysis: the "access to bank credit" and the attributes of the legal system. The second factor was also divided into three indexes namely, protection of creditor rights, protection of shareholders rights, and "efficiency of the legal system". Weill's results showed indications in favour of the positive impact of access to bank credit in the relationship between debt and firm performance and a positive influence of the attributes of the legal system on the relationship between debt and firm performance. Results also suggested that the positive impact of the attributes of the legal system come from the positive influence of the "efficiency of the legal system" index, since both the protection of shareholder rights and the protection of creditor rights have no significant impact on the relationship between debt and a firm's performance.

Ebaid (2009) studied 64 Egyptian firms, which might be considered a small sample, on the 1997-2005 period. On the one hand, the empirical tests indicated that capital structure has a negative impact on the firm's ROA. On the other hand, considering other performance measures such as ROE or gross profit margin capital

structure has no significant impact on a firm's performance. In this way, the author concluded that the choice of capital structure has no significant impact on the financial performance of Egyptian firms listed in the stock exchange.

Salim and Yadav (2012) studied 237 Malaysian listed firms on the Bursa Malaysia Stock exchange in the 1995-2011 period with results showing a negative relationship between short and long term debt and a firm's performance measured by ROE and ROA, but a positive relationship with Tobin's Q and no significant relationship with earning per share (EPS). This study confirms that accounting measures can lead to different results when compared to market measures, as stated by Al-Matari et al. (2014).

With the aim of studying the effects of leverage on firm performance when the industry faces downturns, Gonzalez (2013) focused on a sample of 10,375 firms from 39 different countries in the 1995-2004 period. Countries were divided into four groups: the first group comprises the countries from English origin,[1] the second group is composed by the countries from French origin,[2] the third group of countries is from German origin,[3] and finally the fourth group is composed of Scandinavian origin countries.[4] Results showed that the impact of leverage on firm performance varies with the legal origin of each country. As stated by Gonzalez (2013, p.182) "*The protection of shareholder rights and the system of legal enforcement are key variables for distinguishing when leverage has a negative or a positive effect on corporate operating performance when industries suffer an economic downturn. In countries with a high level of protection of shareholder rights and a strong system of legal enforcement there is a negative effect of leverage on corporate operating performance when industries experience poor performance*". Results showed that French civil law countries, characterized by lower levels of shareholder rights and a weaker system of legal enforcement, present a positive effect of leverage on performance in industry downturns, with a negative relationship in common law countries and no effects on Scandinavian and Germanic origin countries. This study

[1]Countries included are: Australia, Canada, Hong Kong, India, Ireland, Israel Malaysia, New Zealand, Pakistan, Singapore, South Africa, Thailand, United Kingdom and the United States.
[2] Countries included are: Argentina, Belgium, Brazil, Chile, France, Greece, Indonesia, Italy, Mexico, Netherlands, Peru, Philippines, Portugal, Spain and Turkey.
[3] Countries included are: Austria, Germany, Japan, South Korea, Switzerland and Taiwan.
[4] Countries included are: Denmark, Finland, Norway and Sweden.

can be compared to the one of Weill (2008) since the legal origin of the countries is assumed to influence the relationship between debt and performance: Gonzalez (2013) aggregated the countries in groups and Weill (2008) conducted an individual analysis.

Olokoyo (2013) studied 101 Nigerian companies in the 2003-2007 period to determine the overall effect of capital structure on corporate performance. Results diverge with the performance measure used since the conclusion was that capital structure has positive influence on the market performance of Nigerian firms measured by Tobin's Q but it has negative influence on their accounting performance measures (ROA and ROE). These results are similar to the ones of Salim and Yadav (2012) confirming, once again, the different results from the use of accounting and market measures.

Akem et al. (2014) studied 173 companies listed on the Nigeria stock exchange in the 2002-2012 period with results showing a negative relationship between debt (measured by debt to equity ratio, long term debt to capital employed ratio, total debt) and firm performance (measured by ROI and ROA). This study used descriptive, correlation and regression techniques. These results are similar to the ones of Olokoyo (2013) showing a negative effect of debt on a firm's performance measured by accounting measures.

Yazdanfar and Ohmar (2015) examined the relationship between debt ratio and performance among 15,897 small and medium sized enterprises in Sweden in the 2009-2012 period. Results showed that debt negatively affects firm's performance (measured by ROA). This study used three-stage least squares (3SLS) and fixed-effects models to estimate the model, which is not used very often, with the objective of avoiding any potential endogeneity between the dependent and independent variables.

Zeitun and Saleh (2015) studied 400 firms from the Gulf Cooperation Council (GCC) countries in the 2004-2012 period. Results indicated that leverage measured by total debt to total assets ratio is a negative and significant determinant of performance (measured by ROA and Tobin's Q). These results are different from the ones of Salim and Yadav (2012) and Olokoyo (2013) since both of them reached opposite results for accounting and market performance measures. In addition, this

study also investigated the impact of the recent financial crisis on GCC firms with results showing a negative influence of this variable on firms' performance.

El-Chaarani (2015) studied 5,050 firms in the year of 2012 having obtained mixed results. Following the same methodology as Gonzalez (2013), countries were aggregated in three legal origins: first the French civil law countries with the worst legal protections composed by France and Italy; second, English common law countries characterized by the strongest protection for minor investors composed by United Kingdom and Ireland; and finally, German and Scandinavian civil law countries characterized by being in the middle in terms of protection and composed by Germany, Austria and Switzerland. This approach is similar to that of Gonzalez (2013) with the exception of German and Scandinavian civil law countries that were divided in the previous study. Using Tobin's Q as a performance measure, results showed that debt was negatively related to the firm's performance in French civil law countries; in common law countries a positive relationship was found; in the case of German and Scandinavian civil law countries the relationship obtained was not statistically significant . These results may link the relationship between debt and a firm's performance to the institutional framework since the results show a positive relationship in the countries with the strongest protection and a negative relationship in French civil law countries characterized by the worst legal protections. However these results are opposite from those obtained by Gonzalez (2013). A common result in both studies is the insignificant results in German and Scandinavian civil law countries. These divergent results might be explained by the fact that the analysis of Gonzalez (2013) was made for the specific case of industry downturns where "*countries with a high level of protection of shareholder rights and a strong system of legal enforcement present a negative effect of leverage on corporate operating performance*" (Gonzalez, 2013, p.182). The study of El-Chaarani (2015) has the major problem of focusing only in the year of 2012 which is a small period for this type of analysis.

Finally Tsuruta (2015) studied 90,036 small Japanese firms in the 1996-2006 period. This study was the only one who got a clear positive relationship between debt and a firm's performance. The analysis of the data allowed reaching three different conclusions: first, a firm's performance (measured by operating income to

total assets ratio and sales growth rate) in “highly leveraged firms is higher than in lower leveraged firms”; second, highly “leveraged small firms reduce the burden of debt and avoid the cost of bankruptcy”; and finally “highly leveraged firms use alternative ways of financing like selling bills receivables in order to not increase debt” (Tsuruta, 2015, p.408).

2.4. Critical analysis of the literature reviewed

The effects of debt on a firm’s performance have been studied both with theoretical approaches and empirical studies. Table 5 shows a summary of the fourteen empirical studies reviewed in the previous section showing the diversity of results regarding the effects of debt on a firm’s performance.

Table 5: Summary of empirical studies results

Number of Countries	**Positive relationship**	**Negative relationship**	**Mixed results**	**Total**
One country	1	3	5	9
More than one country	0	1	4	5
Total	1	4	9	14

Source: Own elaboration

The analysis of these results from the empirical studies reinforces the analysis of the theoretical literature by providing divergent results. However, it is interesting to see that there is only one study, namely Tsuruta (2015), presenting a clear positive relationship between debt and a firm’s performance by studying small firms in Japan. In the case of studies focusing on only one country mixed results may result from the use of accounting and market measures as proxies for firm performance. Both Olokoyo (2013) and Salim and Yadav (2012) reached similar results with a negative relationship between debt and a firm’s performance measured by accounting measures and a positive relationship in the case of market measures which is in agreement with the study of Al-Matari et al. (2014) on the use of performance measures and consequent mixed results with use of the two types of performance measures.

Another important factor to take in consideration are the divergent results between the two measures of debt (short term debt and long term debt) and a firm's performance since as shown by Abor (2005) and Abor (2007), among others, the effects can be different with a tendency for a positive effect of short term debt on firm performance and negative effect of long term debt.

Also relevant is the fact that most studies focusing on more than one country obtained mixed results not reaching a solid conclusion which might indicate the effect of the different institutional frameworks in the analysis. It is worth noting that most empirical studies reviewed in this study were focused on only one country, therefore the different conclusions presented by these studies may result from the influence of the institutional framework of the country in analysis. Weill (2008) had a different approach with seven European countries and analyzed the impact of the different institutional frameworks. Gonzalez (2013) and El-Chaarani (2015) also include the institutional framework in their studies but an individual analysis by country was not made, instead countries were aggregated in English origin common law countries, French origin civil law countries, German origin civil law countries and Scandinavian origin civil law countries. The results of these studies also diverge between countries and suggest the influence of the institutional factors on the study. Zeitun and Saleh (2015) and Abor (2007) also studied more than one country but the analysis was not done in order to draw conclusions on the effect of different institutional frameworks.

Finally, some of the reviewed studies also have small samples in the number of firms studied. For example, Abor (2005) only studied 22 firms, Ebaid (2009) 64 firms and Olokoyo (2013) presents a sample of 101 firms. Another important factor is the period of the analysis: some studies were focused on small periods which might compromise the results. This is the case of two studies that focus on analyzing the impact of the institutional framework in the relationship between debt and a firm's performance on European countries: Weill (2008) address the 1998-2000 period (3 years) and El-Chaarani (2015) only focuses on the year of 2012.

To sum up the factors mentioned above justify the need for a study focusing on the impact of the institutional framework on the relationship between debt and firm performance focusing on a solid sample in order to fill this research gap.

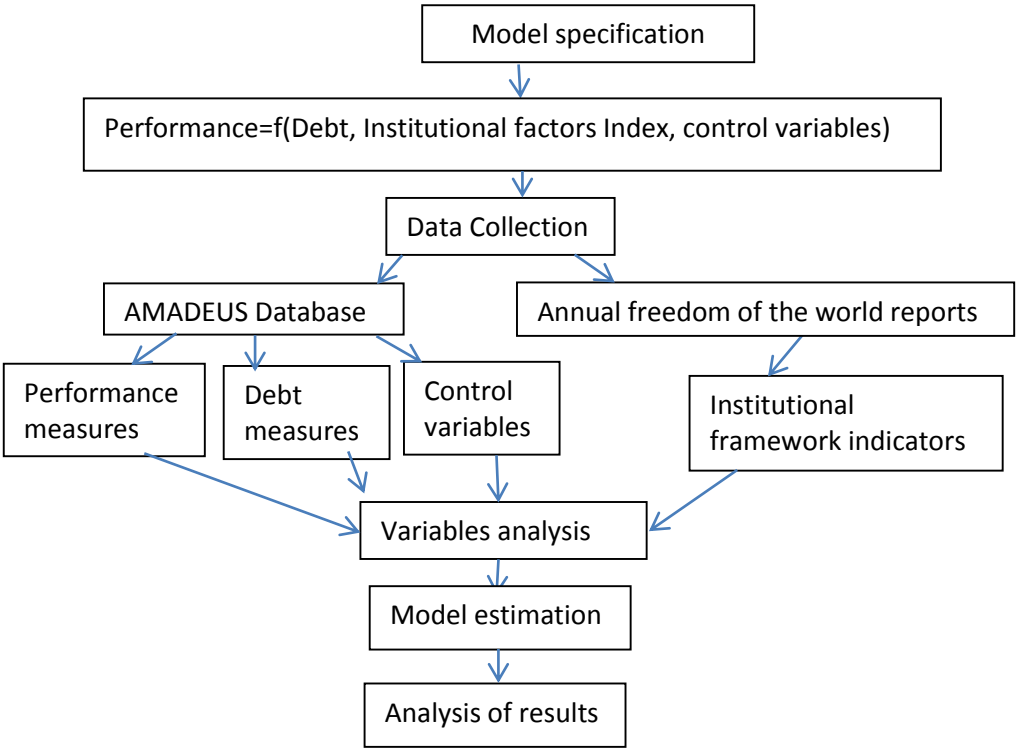
3. Methodology

In this Chapter it will be discussed the methodology of this study, starting by the presentation of the phases of the study (section 3.1) followed by the model specification (section 3.2) and finally data sources and characterization of the sample are presented (section 3.3).

3.1. Phases of the study

This study aims at studying the effect of institutional framework factors on the relationship between debt and a firm's performance. In this way figure 1 shows the different steps to be implemented in order to achieve those objectives.

Figure 1: Phases of the study



First, we need to specify the model, defining the variables to be included and that can explain the firm's performance. Second, it is necessary to collect data for the different variables through different databases and make a brief descriptive analysis of the variables of the model. Finally, it is necessary to estimate the model using an

appropriate method and to analyse the results in order to answer the research question: "Does the institutional framework affect the relationship between debt and a firm's performance?".

3.2. Model specification

Considering the input of the literature review this section presents a model in order to test the impact of the institutional factors on the relationship between debt and firm performance. In this way, this study assumes that a firm's performance can be affected by debt (the main explanatory variable) and introduces an interactive term between institutional factors and debt. Additionally, like most empirical studies, we introduce some control variables, such as firm size, growth and age, as well as dummies for time, industry and country. In this way, the model to be estimated is:

$$\boldsymbol{PERF_{it} = \beta_1 DEBT_{i,t-1} + \beta_2 DEBT_{i,t-1} * INST_{i,t} + \beta_3\, SIZE_{i,t-1} + \beta_4 GROWTH_{i,t-1} + \beta_5 AGE_{i,t-1} + \beta_6 YearDummies + \beta_7 SectorDummies + \beta_8 CountryDummies} + \mu_{i,t-1} \qquad \textbf{(1)}$$

Where $PERF_{it}$, the dependent variable, represents the firm performance. Regarding the explanatory variables, $DEBT_{i,t-1}$ represents a debt measure and $DEBT_{i,t-1}*INST_{i,t-1}$ is an interaction term between debt and the institutional factors. Similarly to Gonzalez (2013) this interaction term aims at discovering if the country's legal system influences the effect of debt on a firm´s performance. We also introduce three control variables: $SIZE_{i,t-1}$, $GROWTH_{i,t-1}$ and $AGE_{i,t-1}$ representing the size of the firm, the growth of sales and the age of the firm, respectively. Following the example of Gonzalez (2013) the explanatory variables directly related to the company are lagged one year in order to mitigate the problem of simultaneity between some variables. Like Gonzalez (2013) and Weill (2008), Dummy variables are also used, namely *Year Dummies* to control for macroeconomic factors, two-digit *Sector Dummies* in order to control for specific effects of each individual sector, and *Country Dummies* in order to control for other specific country effects. Finally $\mu_{i,t}$ represents the error term.

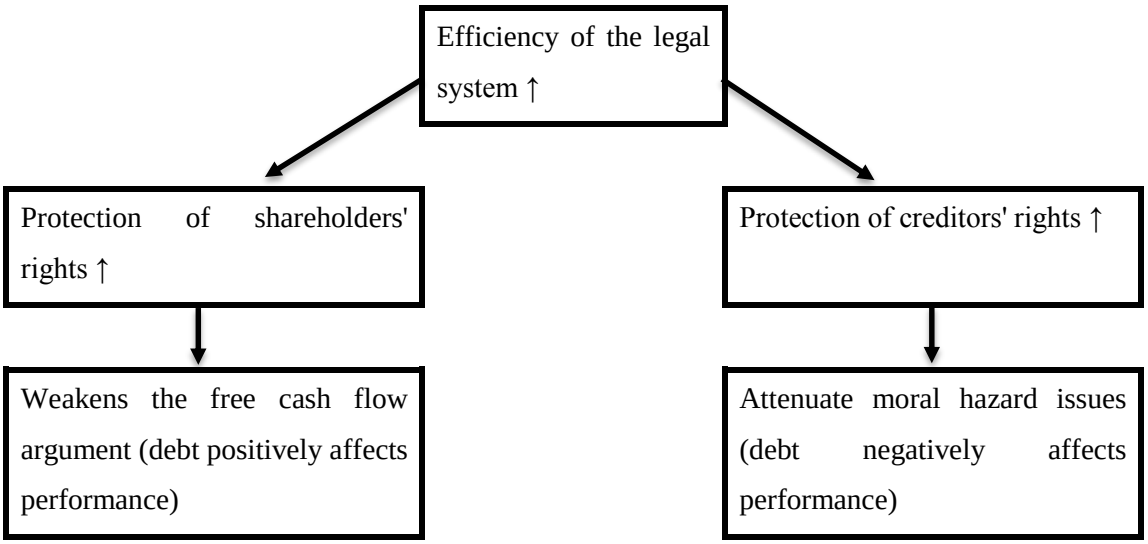
Following the tendency from the studies reviewed (e.g. Simerly and Li (2000); Ebaid (2009); Salim and Yadav (2012); Olokoyo (2013); and Zeitun; Saleh

(2015), among others) this analysis will use two alternative performance measures, the ratio of net income over assets (ROA) and the ratio of net income over equity (ROE), since those are easily accessible and commonly used. As for debt, data collection will focus on long term debt and current liabilities in order to cover the total duration of debt. In this way three proxies of debt are used: the ratios of long term debt, current liabilities and total debt over total assets, similarly to most existing studies (e.g. Abor (2005); Abor (2007); Ebaid (2009); Olokoyo (2013); Akem et al. (2014); among others). Debt is expected to have ambiguous effects on a firm's performance since as the literature review showed empirical results on this matter are inconclusive as well as the theoretical arguments.

Regarding the institutional framework, we focus on the index of "Legal Structure and Security of Property Rights" (*Rights*) as well as the index of credit market regulation (*Credit*). These indicators were chosen for their proximity to the ones used by Weill (2008) and Gonzalez (2013) and by their availability for the period of analysis. The two indexes were obtained from the Economic Freedom of the World Report from 2010 to 2015.

The first index focuses on the "protection of persons and their rightfully acquired property as a central element of economic freedom and a civil society" (Gwartney, Hall and Lawson, 2010, p.3). This first indicator focus on the "efficiency of the legal system" as well as the "protection of rights" for both shareholders and creditors, the main ingredients of an "economic freedom legal system are the rule of law, security of property rights, an independent judiciary, and an impartial court system" (Gwartney et al., 2010, p.5). Following Weill (2008)'s arguments, an improvement in the "efficiency of the legal system" increases protection of the rights of shareholders and debtholders (creditors), diminishing the role of the "free cash flow" argument but also reducing "*moral hazard problems*" resulting from frictions between debtholders and shareholders. Figure 2 synthesizes the channels through which the "efficiency of the legal system" affects the relationship between debt and performance.

Figure 2: Effects of the efficiency of the legal system on the relationship between debt and a firm's performance



To sum up, insofar as the "efficiency legal system" affects two mechanisms justifying a different type of relationship between debt and performance (positive / negative), it is not possible to anticipate its ultimate impact.

The second index (credit) focuses on "regulatory restraints that limit the freedom of exchange in credit, labor, and product markets" (Gwartney et al., 2010, p.5). For this index of credit market regulation, we focus on the first component (5A), which is divided in four sub-components, reflecting conditions in the domestic credit market. These sub-components are "ownership of banks, foreign bank competition, private sector credit and interest rate controls". According to (Gwartney et al., 2010, p.6) *"The first two sub-components provide evidence on the extent to which the banking industry is dominated by private firms and whether foreign banks are permitted to compete in the market. The final two sub-components indicate the extent to which credit is supplied to the private sector and whether controls on interest rates interfere with the market in credit. Countries that use a private banking system to allocate credit to private parties and refrain from controlling interest rates receive higher ratings for this regulatory component*". An higher rating in this regulatory component is associated with higher institutional quality which, according to Weill (2008) will have a positive influence on the relationship between debt and a firm's performance. According to Weill (2008) international differences in access to

credit result in competitiveness advantages increasing a firm's performance

Finally, control variables are also included in the analysis with the input of the literature review. The first control variable is firm size which is included in all the empirical studies reviewed, excluding Akem et al. (2014). Usually firm size is expressed through the logarithm of assets, sales or number of employees. We opt by the logarithm of assets since most reviewed studies adopt this measure (e.g. Weill (2008); El-Chaarani (2015); Zeitun and Saleh (2015)). It is anticipated an ambiguous result on the relationship between a firm's size and firm performance since there are opposite arguments on this matter. On the one hand larger companies tend to exploit economies of scale and have better abilities to use technology as well as the ability to achieve better product diversification and larger market shares (Majumbar and Chhibber, 1999; Weill, 2008; Yazdandar and Ohmar, 2015), which justifies the existence of a positive relationship between firm size and performance. On the other hand there is another argument that defends a negative relationship between firm size and a firm's performance suggesting that larger firms come under the control of managers which are driven by their own goals which can result on the replacement of the objective of maximizing the profit function of the firm by the objective of maximizing the managers' utility function (Pervan and Višić, 2012).

Other commonly used control variables are Growth and firm's age. Growth is usually measured as Growth of Sales, appearing in five reviewed studies (Abor, 2005; Abor, 2007; Salim and Yadav, 2012; Zeitun and Saleh, 2015 and El-Chaarani, 2015). This variable is expected to have a positive effect on a firm's performance since growth generates additional income from new investments projects (Zeitun and Saleh 2015). Finally, Age is usually measured as the logarithm of the number of years since firm inception, appearing in five reviewed studies (Majumbar and Chhibber, 1999; Akem et. al, 2014; Yazdanfar and Ohmar, 2015; Tsuruta, 2015 and El-Chaarani 2015). We used LOG(AGE+1) since there are firms with 1 year of existence. In our model firm Age is expected to have an ambiguous result on firm performance. On the one hand a positive effect on firm performance can occur through different factors, starting by learning processes and business experience as well as getting access to more resources and reputation effects which create opportunities for better performance (Majumbar and Chhibber, 1999; Yazdandar and

Ohmar, 2015). On the other hand we can expect negative effects, since with aging it is normal to occur an increase of organizational rigidities, the rise of costs, margins thin, growth slows, obsolescence of assets, and reduction of investment and R&D activities (Loderer and Waelchli, 2009). Aging also seems to increase the diffusion of rent-seeking behavior since corporate governance worsens and CEO payment goes up following the same logic of the negative effects of size on firm's performance (Loderer and Waelchli, 2009).

The variables of the model, the respective proxies and expected effect on firm performance are presented in table 6.

Table 6: Model variables, proxies and expected effects on performance

Variables	Proxies	Expected effect on performance
Debt	Long term debt, current liabilities and total debt to total assets ratios	Positive/Negative
Institutional factors	Credit market regulations (*Credit*)	Positive (through debt)
	Legal structure and security of property rights (*Right*s)	Positive/Negative (through debt)
Size	Logarithm of assets	Positive/Negative
Growth	Annual sales growth rate	Positive
Age	Logarithm of the number of years since firm inception (+1)	Positive/Negative

Source: Own elaboration

3.3. Data sources and characterization of the sample

The present study uses a database of 48,840 firms from nine European countries (Belgium, Finland, France, Germany, Greece, Italy, Portugal, Spain and Sweden) for the 2008-2013 period (293,040 firm-year observations). The sample of companies with data of performance, debt and control variables was obtained through the Amadeus database that includes financial and accounting information for more than 20 million European companies from 43 countries. Using this Database the research strategy was to start by limiting the firms by Region, namely to Western Europe countries. Additionally, our focus was on manufacturing firms with two-digit NACE[5] code from 10 to 32. The following steps to define the search strategy

[5] "Statistical classification of economic activities in the European Community".

included defining the status to active companies and excluding micro companies from the analysis by limiting the number of employees to a minimum of 10 and the turnover to a minimum of 2,000 euros. To finish, the research was limited by availability of the different indicators for the 2008-2013 period. This research strategy enabled us to reach an initial database of 52,980 companies extracted from Amadeus on April 2016. Afterwards we eliminated firms with very high or very low values of debt in each year (the top and bottom 1% firms) to account for possible outliers. Finally the base was then limited with the exclusion of NACE code 12 and 19 since these represent the tobacco and petroleum sector, respectively, with a very low number of companies (together had only 163 companies). This process enabled us to export a final database of 48,840 European companies from nine European countries. Table 7 presents the number of companies by country on the database collected.

Table 7: Number of companies by country

Country (code)	**Number of companies**	**%**
Belgium (BE)	1,560	3.2
Finland (FI)	714	1.5
France (FR)	3,017	6.2
Germany (DE)	1,149	2.3
Greece (GR)	1,284	2.6
Italy (IT)	27,785	56.9
Portugal (PT)	2,763	5.7
Spain (ES)	8,396	17.2
Sweden (SE)	2,172	4.4
Total	48,840	100.0

Source: Own elaboration

We focus on a relevant group of European countries in order to extend the analyses performed by Weill (2008) and El-Chaarani (2015) since both authors studied the effect of the institutional framework in the relationship between debt and firm performance in European countries but in small periods of time. Weill (2008) focuses on six countries (Belgium, France, Germany, Norway, Italy, Spain and

Portugal) in the 1998-2000 period (3 years) and El-Chaarani (2015) analyses eight countries (France, Italy, Spain, Germany, Austria, Switzerland, United Kingdom and Ireland) in the year of 2012. We focus on nine countries in a six year period.

It is interesting to see that more than 50% of our analysis is focused on Italian companies, which is a direct result of a wider availability of data for this country in this larger period of time.

Data collection of institutional framework indicators was based on annual freedom of the world reports focusing on two specific indicators, namely the indicator 2 – "Legal Structure and Security of Property Rights" and 5 – "Regulation of Credit, Labor, and Business": (A) Credit market regulations. Each of these indexes has values from zero to ten with higher values representing better legal structure and security of property rights and better credit marker regulation, respectively.

3.4. Descriptive analysis of the variables

In order to understand the behaviour of the different variables of the model it is important to study their descriptive statistics. In this way table 8 presents the descriptive statistics (mean, maximum, minimum and standard deviation) for the model variables. Table A1 in the appendix also provides the averages by sector.

Table 8: Descriptive statistics

Variable	Mean	Maximum	Minimum	Std. DEV
ROE (%)	11.54	991.57	-996.35	48.59
ROA (%)	4.26	99.01	-89.85	8.64
Total Debt (%)	54.56	159.96	0	21.25
Long term Debt (%)	9.97	93.47	0	12.83
Short term Debt (%)	44.59	158.41	0	20.05
Age	27.00	179.00	0.67	19.92
Assets (thousand euros)	46,819	324,000,000	48	1,581,821
Sales Growth (%)	2.58	369.31	-68.06	22.61
Rights	6.34	8.90	5.30	0.77
Credit	8.66	10.00	6.00	0.83

Source: Own elaboration

Following the order of table 8 the first two variables are used as alternative proxies for the dependent variable (performance). The variable ROE, defined by the ratio of net income over equity, presents high amplitude with a maximum of 991.57% and a minimum of -996.35%. In comparison ROA has a maximum of 99.01% and a minimum of -89.85%. Regarding averages by sector (Table A1 in appendix) sector 21 (Manufacture of basic pharmaceutical products and pharmaceutical preparations) has the higher average values for both of the performance measures (20.83% and 7.9% for the ROE and ROA, respectively) while sector 13 (Manufacture of textiles) has the lowest values (4.78% and 2.25%, respectively for ROE and ROA) compared to the averages of the all sample of 11.54% and 4.26%.

Proceeding with the analysis, the variables of total debt, long term debt and short term debt as ratios of total assets are used as proxies of debt. As shown in table 8 short term debt (mean of 44.59%) represents roughly four times the weight of long term debt (mean of 9.97%) and also with greater volatility. These two variables are added to each other to reach total debt with a mean of 54.56%. The analysis of Table A1 shows that sector 11 (Manufacture of beverages) has at the same time the higher value of long term debt and the lowest value of short term debt (13.60% and 39.31%), while sector 15 (Manufacture of leather and related products) presents the highest average value of short term debt (52.82%) and sector 27 (Manufacture of electrical equipment) presents the lowest average value for long term debt (7.08%).

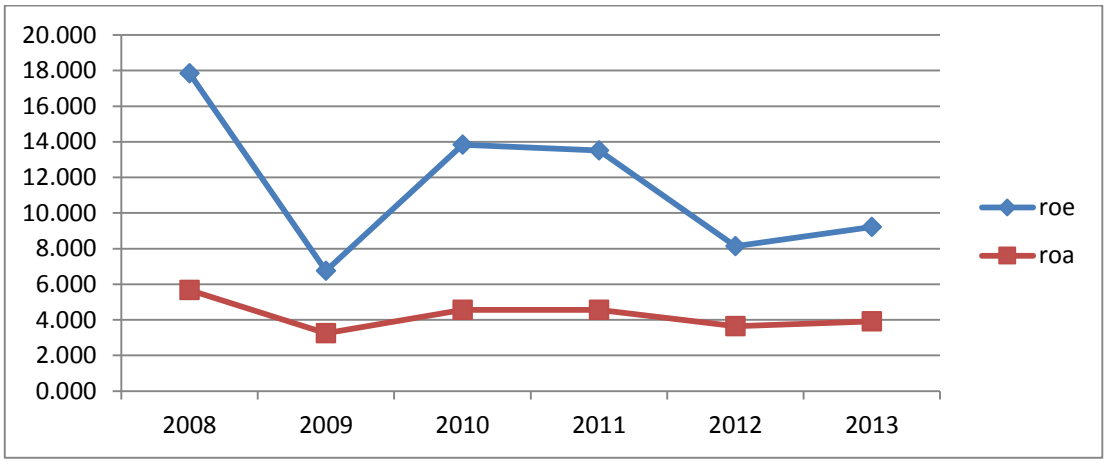
Continuing with the control variables, Age presents an average of 27 years since firm inception with a minimum of 0.67 for a company created in 2008 and a maximum of 179 years for the oldest company in the analysis. Sector 15 presents the lowest average value for Age (about 22 years) and sector 11 presents the highest average value (about 39 years). Assets presents a mean of 46,819 thousand euros with a great amplitude of results, sector 29 (Manufacture of motor vehicles, trailers and semi-trailers) presents the highest average value (561,135 thousand euros) and sector 15 has the lowest average value (7,767 thousand euros). Finally, the variable Growth presents an average of 2.58% with a maximum of 369.01% and a minimum of -68.01%. Sector 21 presents the highest average value (6.44%) and sector 23 (Manufacture of other non-metallic mineral products) presents the lowest average

value (-1.62%).

As for the institutional framework indicators of *Rights* and *Credi*t which are valuated from 0 to 10, it is possible to see that the indicator of rights has an average of 6.34 with a maximum of 8.9 for Finland and a minimum of 5.3 for Greece. As for the indicator of credit regulation the average is 8.66 with a maximum of 10 for Sweden and a minimum of 6 to Greece (Graph 4).

To complement the analysis of the descriptive statistics it is important to analyse the evolution of the main variables of the model (performance, debt and institutional indexes) over the period under review (2008-2013). In this way graph 1 provides de evolution of firm's performance measures.

Graph 1: Evolution of the Performance measures, 2008-2013

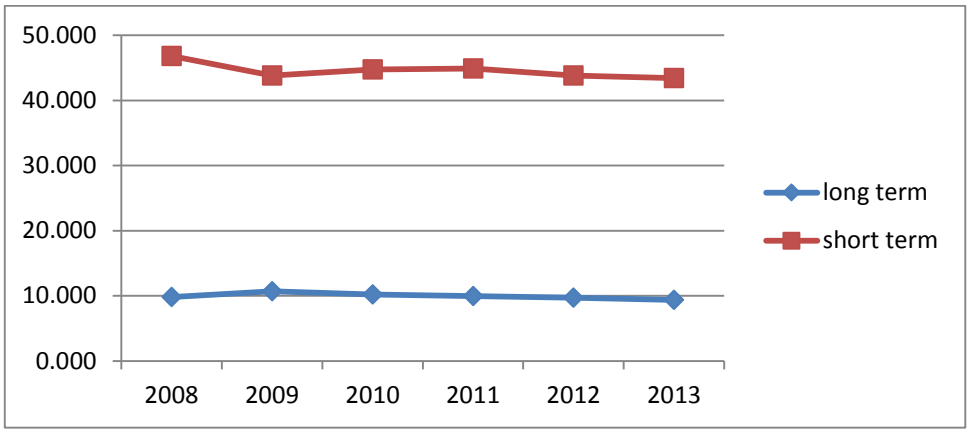


Source: Own elaboration

As it is possible to see on graph 1, performance measures have similar behaviour in the period of analysis with a greater volatility of ROE. The path for both variables is described by an initial declining path in 2008 and 2009 followed by a recovery path until 2010, declining again until 2012 and recovering in 2013. ROE has a slightly different path which might be explained by the way it is measured: ROE is the ratio of net income over equity while ROA is the ratio of net income over assets which lead us to conclude that specially in the year of 2008 there was an increase in equity as a result of lower amounts of debt that might be a result of the crisis that initiated in that year as it is possible to see in graph 2.

Regarding the variables related with debt, graph 2 provides the evolution of short term debt and long term debt over the period of analysis.

Graph 2: Evolution of Debt ratios behavior

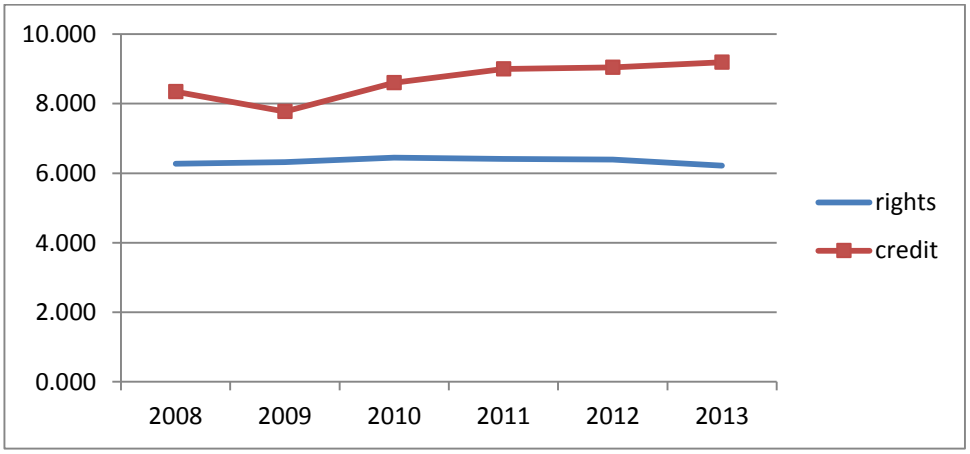


Source: Own elaboration

With Graph 2 it is possible to understand the behavior of debt variables in the 2008-2013 period with a stable path for the two variables. The behavior of the two variables are only different in the 2008-2009 period where it is possible to observe a small increase in long term debt but a reduction in short term debt. It is important to evidence the fact that the companies of this sample are financing their needs mainly through short term debt.

Finally, with regard to the institutional indexes graph 3 presents the evolution over the period of analysis.

Graph 3: Evolution of institutional framework indicators behavior

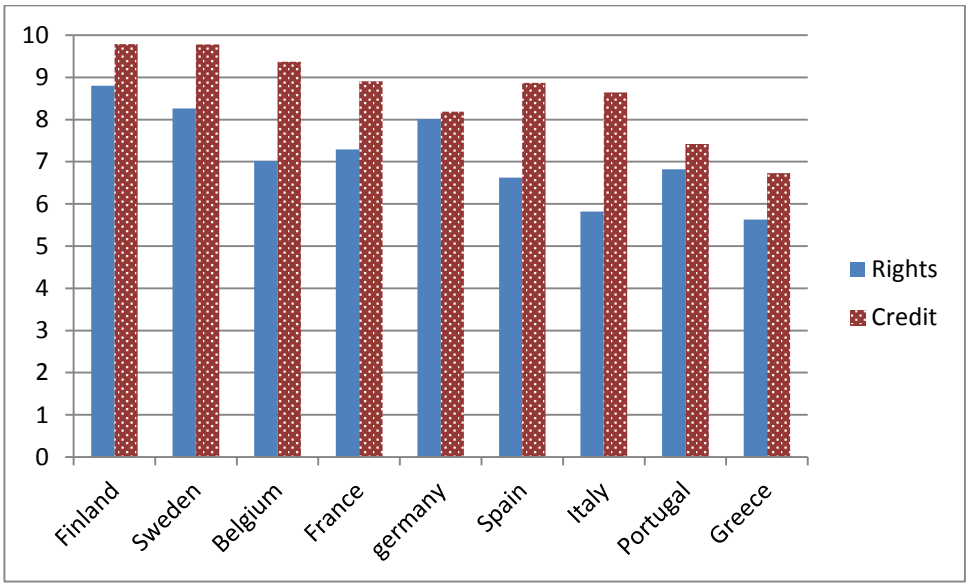


Source: Own elaboration

The evolution of institutional framework indicators is presented in Graph 3 where it is possible to see that there is not much variability over the years analyzed, especially in the first indicator of legal structure and security of property rights (*Rights*). Nevertheless it is positive to see an improvement in credit market regulation (*Credit*) in the 2009-2013 period which might be a cause of the financial crisis that started in 2008 and consequent tightening of financial market rules.

Finally and because the sample consists of firms from nine different countries it is important to analyze the average of the variables by country. Starting with the institutional indicators, Graph 4 presents the indexes by country.

Graph 4: The institutional indexes by country



Source: Own elaboration

By the analysis of graph 4 it is possible to take different conclusions. First the countries from the north of Europe have more efficient legal systems since Finland has the higher index in both indicators and Sweden the second higher index also in both indicators. Second it is possible to see that the lower levels for these indexes are concentrated in the countries from the South with Greece having the lowest values in both indicators while France, Belgium and Germany stay in the middle with intermediate values.

Regarding the variables related to the firms Table 9 shows the mean of each variable in each different country of this analysis enabling an initial analysis by country.

Table 9: Averages by country

Country	ROE (%)	ROA (%)	Long term debt (%)	Short term debt (%)	Total debt (%)	Assets (thousands euros)	Growth (%)	Age
Belgium	13.68	5.95	8.93	40.96	49.89	104,124	2.60	31.82
Germany	24.31	8.33	10.05	30.73	40.78	967,270	4.35	47.52
Spain	5.10	2.92	16.00	36.72	52.72	23,069	0.64	23.57
Finland	16.07	6.82	17.35	35.52	52.87	85,262	4.34	25.67
France	11.82	6.45	5.92	43.83	49.75	34,003	3.15	27.31
Greece	6.30	2.81	10.71	39.86	50.57	22,914	-0.51	83.28
Italy	13.54	4.14	7.01	49.07	56.08	17,460	2.76	24.32
Portugal	5.63	2.73	20.38	41.47	61.85	10,899	3.95	24.59
Sweden	11.29	6.55	14.69	38.45	53.14	51,096	5.41	30.04
Global average	11.54	4.26	9.97	44.59	54.56	46,818	2.58	27.00

Source: Own elaboration

Through table 9 is possible to take some relevant information for this analysis. Starting by an analysis of performance it is clear that companies in Germany have, on average, higher values in terms of ROE and ROA, the two proxies of firm's performance, as well as for the value of Assets used as proxy of firm size, and the lowest value for the total debt ratio. It is interesting to see that Portugal has the lowest average values for ROA and Assets and the second lowest for ROE while having the highest value for total debt. Another relevant factor is that Greece, presenting the oldest companies, on average, in this analysis is the only country presenting negative growth as well as presenting the lowest values for the variables of the institutional framework as referred to above.

4. Results

The present chapter presents and discusses the results of the study. It starts with the presentation of a correlation analysis (section 4.1), the presentation of an econometrical analysis by country (section 4.2) followed by the estimation of the model and analysis of results in section (4.3).

4.1. Correlation analysis

Before proceeding to the model estimation it is important to understand the correlations between the variables of the model. The corresponding correlation matrix is presented in Table 10

Table 10: Correlation matrix

Variables	ROE	ROA	Long Term Debt	Short Term Debt	Total Debt	LOG (Assets)	Growth	LOG (Age+1)
ROE	1.000							
ROA	0.574 0.000	1.000						
Long term Debt	-0.097 0.000	-0.182 0.000	1.000					
Short term Debt	0.064 0.000	-0.123 0.000	-0.223 0.000	1.000				
Total Debt	0.002 0.279	-0.225 0.000	0.393 0.000	0.808 0.000	1.000			
LOG(Assets)	-0.027 0.000	0.029 0.000	-0.011 0.000	-0.119 0.000	-0.119 0.000	1.000		
Growth	0.188 0.000	0.225 0.000	-0.001 0.695	0.128 0.000	0.120 0.000	0.015 0.000	1.000	
LOG(Age+1)	-0.084 0.000	-0.051 0.000	-0.052 0.000	-0.223 0.000	-0.243 0.000	0.302 0.000	-0.075 0.000	1.000

Source: Own elaboration

The analysis of the correlation matrix enables us to see that there are no high values of correlation between the independent variables that would cause problems in the model estimation. In fact, the higher value (0.808) is between short term debt and total debt which are alternative proxies for debt. All other correlation coefficients between independent variables are smaller than 0.4.

4.2. Analysis by country

This section starts with the presentation of a synthesis of results of the regressions by country (see table 11) and the respective analysis of the results of the estimation of the model. Since we are using panel data, according to Wooldridge (2001) two different methods of estimation can be used: fixed effects and random effects. However, since we are using sector dummies that remain constant for each firm over time, the fixed effects model is not suitable. In this way we use the random effects GLS regression method.[6] All continuous variables were standardized similarly to Gonzalez (2013). For each country we estimate six models since we have two alternative measures of performance and three alternative measures of debt. These regressions enable an initial analysis in order to study the impact of debt on firm's performance in each individual country. The regressions are shown in tables A2 to A6 in the appendix. A summary of the results is provided by table 11.

Table 11: Summary of the results of the estimations by country

Country	Belgium		Germany		Spain		Finland		France	
Variables	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE
Long term debt	-	0	-	0	-	-	-	0	-	-
Short term debt	+	+	0	+	+	0	+	+	0	0
Total debt	0	+	-	+	-	-	0	+	-	0
Size=log(assets)	-	-	-	-	+	+	-	-	-	0
Growth	+	+	+	+	+	+	+	+	+	+
Age=log(age+1)	0	0	0	0	-	-	-	0	-	-
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

[6] All estimations were made using STATA.

Table 11 (*cont.*)

Country	Greece		Italy		Portugal		Sweden	
Variables	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE
Long term debt	-	-	-	-	-	-	-	-
Short term debt	+	+	-	+	0	0	+	0
Total debt	0	0	-	+	-	-	-	0
Size=log(assets)	-	-	-	-	+	0	0	0
Growth	+	+	+	+	+	+	+	+
Age=log(age+1)	0	0	-	-	-	-	0	0
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Legend: 0: non-significant relationship; +: positive relationship; -: negative relationship

Source: Own elaboration

Looking at table 11 it is possible to take some initial conclusions. First and regarding the measures of debt it is possible to conclude that for most countries long term debt has a negative impact on firm's performance independently of the performance measure used, while being not statistically significant in the case of ROE for Germany, Belgium and Finland. As for short term debt it seems to have a positive impact on performance with the exception of the cases of Italy, Portugal and France. In Italy short term debt presents a negative effect on ROA but positive on ROE and the results for short term debt in Portugal and France are non-significant. These divergent results between short term debt and long term debt are in line with some of the conclusions of the literature, namely Abor (2005) and Abor (2007) who reported similar results. When talking about total debt the results are inconclusive with different results in each country which are dependent of the combined effects of short term debt and long term debt.

The analysis of the control variables also allowed some conclusions. First the variable growth presents a positive effect on ROA and ROE for the nine countries under analysis which is in line with expectations. As for assets (a proxy of firm size) and age the results confirm the ambiguous results already expected from the theoretical point of view:[7] age presents a negative effect in 5 countries but has a positive impact in Germany while being non-significant in 3 countries. Assets presents a negative effect on a firm's performance for most countries but it has a

[7] **Note that there are theoretical arguments supporting both positive and negative effects of size and age on a firm's performance.**

positive effect in Portugal and Spain and it has non-significant effects on Sweden firm's performance.

Since we obtained different results by country, in particular as regards the total debt, this may be a result of the institutional framework of each country. In order to deepen this analysis section 4.3 will estimate the model with the addition of country dummies and interaction terms between debt and the institutional framework indicators.

4.3. The role of institutional factors

This section presents the estimation of the model given by equation (1). We start by estimating the model without considering the interactive term between debt and the institutional framework indicators and then we proceed to the estimation of the model introducing the interactive term. Results of the estimation are in table 12 and table 13, respectively.

Table 12: Results of the model estimation (whole sample)

Variables	ROA			ROE		
Long term debt	-0.062*** (0.003)			-0.036*** (0.003)		
Short term debt		0.009*** (0.003)			0.062*** (0.004)	
Total debt			-0.045*** (0.003)			0.033*** (0.003)
Size=log(assets)	-0.033*** (0.004)	-0.038*** (0.004)	-0.036*** (0.004)	-0.043*** (0.003)	-0.042*** (0.003)	-0.044*** (0.003)
Growth	0.098*** (0.002)	0.098*** (0.002)	0.102*** (0.002)	0.078*** (0.002)	0.073*** (0.002)	0.076*** (0.002)
Age=Log(age+1)	-0.038*** (0.004)	-0.031*** (0.004)	-0.044*** (0.004)	-0.059*** (0.004)	-0.044*** (0.004)	-0.049*** (0.004)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	244,200	244,200	244,200	244,200	244,200	244.200
R^2	0.076	0.060	0.077	0.034	0.034	0.031

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses.

Source: Own elaboration

The model estimation in table 12 reinforces the conclusions from the analysis of the regressions by country in section 4.2: negative effect of long term debt on ROA and ROE, positive effects of short term debt on ROA and ROE and divergent results for total debt (a negative impact on ROA and positive impact on ROE). As for the control variables, growth presents, as expected, a positive impact on a firm's performance and age presents a negative impact as well as firm size. As expected, Growth presents a positive relationship with performance. Zeitun and Saleh (2015) highlight that sales growth can be seen as a proxy for growth opportunities and a firm with higher growth opportunities tends to have higher performance. For its part, the variables size and age have a negative relationship with performance. In the case of size, the negative sign of the coefficient supports the idea shared by the managerial theories of the firm that a firm may have other objectives than profit maximization, such as the utility maximization of managers when corporate ownership and firm's management is different (Pervan and Višić, 2012). With respect to the variable age, the negative relationship with performance supports the idea that with the aging of the firm tends to occur an increase of organizational rigidities, the equipment becomes obsolete, which causes increased costs and reduced margins (Loderer and Waelchli, 2009).

For the final estimation, presented in table 13, we created two dummies (*Dcredit* and *Drights*) for the institutional framework indicator of credit and rights in order to create the interactive term between these indicators and debt similarly to Gonzalez (2013). The dummies are defined as follows: Drights=1 if the variable *Rights* is above average and Drights=0 otherwise; as for Dcredit the same logic is applied (Dcredit=1 if the variable Credit is above average and Dcredit=0 otherwise).

Table 13: Model estimation with interactive term between debt and institutional indicators

Variables	**ROA**			**ROE**		
Long term debt	-0.069*** (0.004)			-0.037*** (0.006)		
Short term debt		-0.033*** (0.004)			0.072*** (0.005)	
Total debt			-0.080*** (0.004)			0.051*** (0.005)
Size=log(assets)	-0.032*** (0.004)	-0.038*** (0.004)	-0.035*** (0.004)	-0.043*** (0.003)	-0.042*** (0.003)	-0.046*** (0.003)
Growth	0.098*** (0.002)	0.099*** (0.002)	0.103*** (0.002)	0.078*** (0.002)	0.073*** (0.002)	0.076*** (0.002)
Age=Log(age+1)	-0.038*** (0.004)	-0.035*** (0.004)	-0.047*** (0.004)	-0.059*** (0.004)	-0.043*** (0.004)	-0.048*** (0.004)
Long term debt*Drights	0.017*** (0.005)			-0.002 (0.006)		
Long term debt*Dcredit	-0.004 (0.003)			0.003 (0.005)		
Short term debt*Drights		0.075*** (0.007)			-0.040*** (0.008)	
Short term debt*Dcredit		0.021*** (0.003)			0.008 (0.005)	
Total debt*Drights			0.056*** (0.007)			-0.059*** (0.007)
Total debt*Dcredit			0.020*** (0.003)			0.009* (0.005)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	244,200	244,200	244,200	244,200	244,200	244,200
R^2	0.076	0.062	0.077	0.034	0.034	0.032

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table 13 presents the complete estimation of the model with the inclusion of interactive terms between the three alternative measures of debt and the two dummies for the institutional framework. It is important to emphasize that with the inclusion of interactive terms the results of the control variables remain largely unchanged: they have the same sign presenting only slight changes in the value of the coefficients.

Regarding debt measures, with the inclusion of these interactive terms the coefficients of the variables long term debt and total debt also maintained the respective signal; there was only a change in the effect of short term debt that now presents a negative effect on ROA and positive effect on ROE.

The analysis of the coefficients of the interactive terms allows us to take some conclusions on the effect of the institutional framework on the relationship between debt and firm's performance. These variables capture the differential effect of the debt variable on a firm's performance in countries with above average values for the institutional framework indexes (compared to this effect in countries with below average values). With respect to the interactive term of the variable debt and the dummy *Dcredit* the result obtained was either not statistically significant (when using long term debt) or positive and statistically significant (when resorting to short term and total debt as proxies for debt). This result suggests that the favourable effect of debt on a firm's performance is more relevant in countries with credit market regulation above average which means that a better credit market regulation is indeed improving competitiveness and firm performance as said by Weill (2008). This result is similar to that of Weill (2008) who obtained positive results for the impact of access to bank credit in the relationship between debt and a firm's.

As for the interactive term of the variable debt and the dummy Drights (the indicator of "efficiency of the legal system" and protection of rights) we found contradictory results depending on the performance measure used: regardless of the proxy used for debt, the coefficient of the interactive term is positive and statistically significant when performance is measured by return on assets (ROA) while a negative coefficient was obtained when using ROE. The positive effect obtained when using ROA suggests a higher relevance of the "free cash flow" argument compared with moral hazard problems arising from the conflict between creditors and shareholders in countries characterized by higher "efficiency of the legal system". However, the negative effect obtained when resorting to ROE suggests the opposite. In this way it is difficult to draw conclusions on the differential impact of debt on a firm's performance in countries with above average values for the indicator of "efficiency of the legal system". Note that Gonzalez (2013) concluded that when the "protection of property rights" is higher and the "system of legal enforcement" is

robust, the effect of debt on firm operating performance when industry faces crisis is negative. According to the author this means that when the institutional quality is high, the costs of financial distress play a more important role than the disciplinarian role of debt. As for Weill (2008), the author concluded by a positive impact of the efficiency of the legal system with no significant results for the protection of both shareholder and creditor rights.

5. Conclusions

The effect of debt on a firm's performance is a relevant theme to managers for a long time. As we have mentioned previously this subject has already been studied from different theoretical perspectives (e.g. the agency cost theory or the trade-off theory, among others) as well as numerous empirical studies. Both the theoretical perspectives and the empirical studies reach divergent results with regard to the impact of debt on a firm's performance.

Weill (2008) reports that empirical studies usually focus only on one country and suggests that the different results evidenced in the empirical literature may derive from the influence of the institutional framework on the relationship. This perspective was also shared by Gonzalez (2013) and El-Chaarani (2015) but the three authors used small samples which created a research gap that this study explores. In this way the objective of this study was to answer the following research question: Does the institutional framework affect the relationship between debt and a firm's performance?

In order to answer the research question we focused on a sample of 48,840 firms from nine European countries (Belgium, Finland, France, Germany, Greece, Italy, Portugal, Spain and Sweden) over the 2008-2013 period.

The results of the model estimation using a random effects model show that the institutional framework is indeed affecting the relationship between debt and firm performance specially when measured by the indicator of credit market regulation. The results of the estimation suggest that the beneficial effect of debt on a firm's performance is more substantial in countries with credit regulation above average. As for the indicator of Legal Structure and Security of Property Rights the results are different depending on the performance measure used, not allowing a solid conclusion to this study. The differential effects of debt on a firm's performance in countries with an above average Legal Structure and Security of Property Rights is positive when measured by ROA but negative when measured by ROE. These opposite effects suggest the need for more research, particularly in order to understand to what extent the use of different performance measures causes either a different impact of debt on a firm's performance or a different effect of institutional

indicators in the relationship between debt and performance.

Furthermore it seems relevant to enhance the divergent results on the effects of debt on firm's performance by the division between long term debt and short term debt, similarly to Abor (2005) and Abor (2007) among others. As referred to above, long term debt seems to be the major cause of a negative relationship between the variables of debt and a firm's performance since none of the regressions of this study showed positive results for this variable. As for short term debt it appears to be related with a positive impact on a firm's performance. These facts might open the path for another studies focusing on explaining the divergent results of debt on firm's performance by focusing in this division of short term and long term debt.

Despite the consistency of this study the results still have some limitations, namely the availability of institutional framework indicators, as a major focus of this study, for the period of analysis which could improve the results of the estimation by focusing on different aspects of the institutional framework of each country. Another limitation is the number of firms by country, which as a results of the research strategy, is not well balanced. Italian companies represent half of the sample which might be important to take into consideration.

Future research should focus on eliminating the limitations of this study by focusing in more complete and balanced databases and including more institutional framework indicators which should be available for larger periods of time in the future.

References

Abor, J. (2005), "The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana", *Journal of Risk Finance*, Vol. 6, Nº. 5, pp. 438-445.

Abor, J. (2007), "Debt policy and performance of SMEs: evidence from Ghanaian and South African firms", *Journal of Risk Finance*, Vol. 8, Nº. 4, pp. 364-379.

Akeem L.B. , Edwin T.K. , Kiyanjui, M.W.and Kayode, A.M. (2014) "Effects of Capital Structure on Firm's Performance: Empirical Study of Manufacturing Companies in Nigeria", *Journal of Finance and Investment Analysis*, Vol. 3, Nº. 4, pp. 39-57.

Al-Matari, E.S., Al-Swidi, A.K. and Fadzil, F.H.B. (2014), "The Measurements of Firm Performance's Dimensions", *Asian Journal of Finance & Accounting*, Vol. 6, Nº. 1, pp. 24-49.

Anderson, C.R., Mansi, A.S. and Reeb, M.D. (2003), "Founding family ownership and the agency cost of debt", *Journal of Financial Economics*, Vol. 68, Nº. 2, pp. 263-285.

Casey, K.M. and Anderson, D.C. (1997), "A note on institutional ownership and capital structure: evidence from the petroleum industry", *Oil and Gas Tax Quarterly*, Vol. 45, Nº. 4, pp. 727-736.

Chittenden, F., Hall, G. and Hutchinson, P. (1996), "Small firm growth, access to capital markets and financial structure: review of issues and an empirical investigation", *Small Business Economics*, Vol. 8, Nº. 1, pp. 59-67.

Cho, H., and Pucik, V. (2005), "Relationship between innovativeness, quality, growth, profitability, and market value." *Strategic Management Journal*, Vol. 26, Nº. 6, pp. 555-575.

Demirguc-Kunt, A. and R. Levine, (2000), "Bank-Based and Market-Based Financial Systems: Cross-Country Comparisons" *A cross-country comparison of banks, markets, and development* [e-book]. Cambridge and London: 2001, pp 81-140.

Ebaid, I.E. (2009) "The impact of capital-structure choice on firm performance: empirical evidence from Egypt", *The Journal of Risk Finance*, Vol. 10, Nº. 5, pp. 477-487.

El-Chaarani,H.(2015),"The Impact of Financial and Legal Structures on the Performance of European Listed Firms", *The International Journal of Business and Finance Research*, Vol. 9, Nº2, pp. 39-52.

Fama, E.F. and French, K.R. (2002), "Testing trade-off and pecking order predictions about dividends and debt", *Review of Financial Studies*, Vol. 15, Nº 1, pp. 1-33.

Gonzalez, V.M. (2013), "Leverage and corporate performance: International evidence", *International Review of Economics and Finance*, Vol. 25, pp. 169-184.

Gwartney, J., Hall, J. and Lawson, R. (2010), "The Economic freedom of the world: 2010 Annual report", Canada, Fraser Institute.

Hamilton, R.T. and Fox, M.A. (1998), "The financing preferences of small firm owners", *International Journal of Entrepreneurial Behaviour and Research*, Vol.3, Nº 4, pp. 239-248.

Holmes, S. and Kent, P. (1991), "An empirical analysis of the financial structure of small and large Australian manufacturing enterprises", *Journal of Small Business Finance*, Vol. 1, Nº 2, pp. 141-154.

Jensen, M. (1986), "Agency costs of free cash flow, corporate finance, and takeover", *The American Economic Review*, Vol.76, Nº 2, pp. 323-329.

Jensen, M. and Meckling, W. (1976), "Theory of the firm: managerial behaviour, agency costs and ownership structure", *Journal of Financial Economics*, Vol.3, Nº 4, pp. 305-360.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A. and Vishny, R.W. (1998), "Law and Finance" , *Journal of Political Economy*, Vol. 106, Nº 6, pp. 1113-1155.

Loderer, C. and Waelchli, U. (2010), "Firm age and performance", Working paper (University of Bern, Switzerland)

Majumdar, S.K. and Chhibber, P. (1999), "Capital structure and performance: evidence from a transition economy on an aspect of corporate governance", Public Choice, Vol. 98, Nºs 3/4, pp. 287-305.

Miller, M. H. (1977), "Debt and Taxes" *Journal of Finance*, Vol. 32, Nº 2, pp. 261–275.

Modigliani, F. and Miller, M.H. (1958), "The cost of capital, corporation finance, and the theory of investment", *American Economic Review*, Vol. 48, Nº 3, pp. 261-297.

Modigliani, F. and Miller, M.H. (1963), "Corporate Income Taxes and the Cost of Capital: A Correction", *American Economic Review*, Vol. 53, Nº 3, pp. 433-443.

Myers, S.C. (1977), "Determinants of corporate borrowing", *Journal of Financial Economics*, Vol. 5, pp. 116-124

Myers, S.C., Majluf, Nicholas S. (1984), "Corporate financing and investment decisions when firms have information that investors do not have", *Journal of Financial Economics,*Vol. 13,Nº 2, pp. 187–221.

Myers, S.C. (2001), "Capital structure", *Journal of Economic Perspectives* Vol. 15, Nº 2, pp. 81-102

Olokoyo, F.O. (2013) "Capital structure and corporate performance of Nigerian quoted firms: A panel data approach", *African Development Review*, Vol. 25, Nº 3, pp. 358-369.

Ooi, J.T.L. (2000), "Managerial opportunism and the capital structure decisions of property companies", *Journal of Property Investment and Finance*, Vol. 18, Nº 3, pp. 316-331.

Pervan, M. and Višić, J. (2012), "Influence of firm size on its business success", *Croatian Operational Research Review,* Vol.3, pp. 213-223

Salim, M. and Yadav, R. (2012),"Capital structure and firm performance: evidence from Malaysian listed companies", *Procedia – Social and Behavioural Sciences*, Vol. 65, Nº 1, pp. 156-166.

Santos J.B. and, Brito L. A. L. (2012),"Toward a Subjective Measurement Model for Firm Performance", *Brazil Administration Review*, Vol. 9, Nº 6, pp. 95-117

Scott, J. (1977),"Bankruptcy, secured debt, and optimal capital structure", *The Journal of Finance*, Vol. 32, Nº 1, pp. 1-19.

Sheikh, N. A. and Wang, Z.(2011), "Determinants of capital structure: an empirical study of firms in manufacturing industry of Pakistan", *Managerial Finance*, Vol. 37, Nº 2, pp. 117-133.

Simerly, R.L. and Li, M. (2000), "Environmental dynamism, capital structure, and performance: a theoretical integration and an empirical test", *Strategic Management Journal*, Vol. 21, Nº 1, pp. 31-49.

Tsuruta, D. (2015). "Leverage and firm performance of small businesses: evidence from Japan". *Small Business Economics*, Vol. 44, Nº2, pp. 385-410.

Venkatraman, N. and Ramanujam, V. (1987). "Measurement of business economic performance: an examination of method convergent". *Journal of Management*, Vol 13, Nº 1, pp. 109-122.

Weill, L. (2008), "Leverage and corporate performance: does institutional environment matter?", *Small Business Economics*, Vol. 30, Nº 3, pp. 251-265.

Wooldridge, J.M. (2001), "Econometric Analysis of Cross Section and Panel Data" The MIT Press Cambridge, Massachusetts

Yazdanfar, D. and Ohmar, P. (2015), “Debt financing and firm performance: an empirical study based on Swedish data”, *Journal of Risk Finance*, Vol. 16, Nº 1, pp. 102-118.

Zeitun, R and Saleh, A.S. (2015),"Dynamic performance, financial leverage and financial crisis: evidence from GCC countries", *EuroMed Journal of Business*, Vol. 10, Nº 2, pp. 147-162.

Appendix

Table A1: Variables average by sector

Nace2	ROE (%)	ROA (%)	Long term debt (%)	Short term Debt (%)	Assets (thousand euros)	Growth (%)	Age	Number of firms	%
10	10.09	4.01	13.08	44.21	26,556	5.31	29.96	5,354	10.96
11	7.27	3.37	13.60	39.31	54,385	4.16	38.74	795	1.63
13	4.78	2.25	9.79	43.04	10,980	1.86	29.21	2,019	4.13
14	13.27	4.17	8.77	48.35	19,945	1.96	24.99	1,563	3.20
15	19.10	5.10	7.47	52.82	7,767	6.02	21.88	1,504	3.08
16	7.03	2.78	11.99	43.44	11,867	-0.04	25.54	1,740	3.56
17	9.59	3.61	10.36	44.66	55,757	3.10	29.44	1,338	2.74
18	8.58	3.24	12.74	41.80	8,227	0.09	27.16	1,646	3.37
20	13.29	5.46	9.00	43.22	94,452	3.85	31.02	2,202	4.51
21	20.83	7.90	8.65	39.52	415,448	6.44	37.74	520	1.06
22	10.85	4.23	10.57	44.08	29,022	2.82	27.27	3,175	6.50
23	5.33	2.36	11.14	39.89	48,109	-1.62	29.57	2,529	5.18
24	6.53	3.34	9.87	43.70	93,086	1.44	30.77	1,255	2.57
25	13.14	4.50	9.83	44.96	10,053	2.34	23.97	9,641	19.74
26	15.86	6.00	7.11	44.17	109,821	3.92	23.90	1,455	2.98
27	16.73	5.77	7.08	45.90	26,812	1.97	26.63	1,891	3.87
28	15.35	5.34	7.87	46.75	27,935	3.25	26.13	5,588	11.44
29	6.94	3.86	9.22	45.14	561,135	1.64	26.85	1,111	2.27
30	14.71	5.41	9.51	45.08	113,123	3.61	25.17	417	0.85
31	5.61	2.36	10.69	46.18	9,028	-0.34	24.08	1,793	3.67
32	13.98	5.24	8.76	42.05	17,203	2.09	26.22	1,304	2.67
Global Mean	11.54	4.26	9.97	44.59	46,818	2.58	27	-	-

Legend: Nace 2 code: 10- Manufacture of food products; 11- Manufacture of beverages; 13- Manufacture of textiles; 14- Manufacture of wearing apparel; 15- Manufacture of leather and related products; 16- Manufacture of wood and products of wood and cork;except furniture;manufacture of articles of straw and plaiting materials; 17- Manufacture of paper and paper products; 18- Printing of reproduction of recorded media; 20- Manufacture of chemicals and chemical products; 21- Manufacture of basic pharmaceutical products and pharmaceutical preparations; 22- Manufacture of rubber and plastic products; 23- Manufacture of other non-metallic mineral products; 24- Manufacture of basic metals; 25- Manufacture of fabricated metal products,except machinery and equipment; 26- Manufacture of computer,electronic and optical products; 27- Manufacture of electrical equipment; 28- Manufacture of machinery and equipment n.e.c.; 29- Manufacture of motor vehicles,trailers and semi-trailers; 30- Manufacture of other transport equipment; 31- Manufacture of furniture; 32- Other manufacturing;

Source: Own elaboration

Table A2: Belgium estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.082*** (0.014)			-0,011 (0.016)		
Short term debt		0.046* (0.024)			0.070*** (0.026)	
Total debt			-0.021 (0.022)			0.054** (0.024)
Size=log(assets)	-0.127 *** (0.023)	-0.147*** (0.023)	-0.149*** (0.026)	-0.053*** (0.020)	-0.048*** (0.018)	-0.059*** (0.020)
Growth	0.107*** (0.011)	0.104*** (0.011)	0.109*** (0.011)	0.053*** (0.009)	0.047*** (0.009)	0.049*** (0.009)
Age=log(age+1)	-0.005 (0.025)	0.013 (0.026)	0.005 (0.026)	0.016 (0.022)	0.023 (0.021)	0.027 (0.023)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7.800	7.800	7.800	7.800	7.800	7.800
R^2	0.056	0.036	0.0459	0.0237	0.0314	0.0280

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A3: Germany estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.052** (0.020)			-0.056 (0.038)		
Short term debt		-0.008 (0.031)			0.165*** (0.053)	
Total debt			-0.066** (0.030)			0.119*** (0.041)
Size=log(assets)	-0.188*** (0.033)	-0.200*** (0.033)	-0.193*** (0.033)	-0.073*** (0.027)	-0.072*** (0.027)	-0.087*** (0.027)
Growth	0.137*** (0.017)	0.138*** (0.017)	0.140*** (0.017)	0.106*** (0.019)	0.099*** (0.019)	0.101*** (0,019)
Age=log(age+1)	0.036 (0.023)	0.035 (0.024)	0.030 (0.024)	0.022 (0.027)	0.035 (0.026)	0.031 (0.026)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5.745	5.745	5.745	5.745	5.745	5.745
R^2	0.066	0.057	0.067	0.035	0.051	0.037

Legend:*p<.1;**p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A4: Spain estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.053*** (0.005)			-0.030*** (0.005)		
Short term debt		0.049*** (0.008)			0.008 (0.007)	
Total debt			-0.016** (0.008)			-0.023*** (0.006)
Size=log(assets)	0.073*** (0.009)	0.072*** (0.009)	0.074*** (0.009)	0.037*** (0.005)	0.039*** (0.005)	0.038*** (0.005)
Growth	0.099*** (0.005)	0.094*** (0.005)	0.100*** (0.005)	0.068*** (0.004)	0.066*** (0.004)	0.069*** (0.004)
Age=log(age+1)	-0.093*** (0.009)	-0.071*** (0.010)	-0.082*** (0.010)	-0.058*** (0.006)	-0.048*** (0.006)	-0.056*** (0.006)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	41.980	41.980	41.980	41.980	41.980	41.980
R^2	0.085	0.064	0.075	0.038	0.032	0.035

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A5: Finland estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.076*** (0.020)			-0.020 (0.023)		
Short term debt		0.090** (0.041)			0.159*** (0.054)	
Total debt			-0.023 (0.023)			0.085*** (0.031)
Size=log(assets)	-0.084*** (0.031)	-0.063** (0.031)	-0.071** (0.032)	-0.044** (0.020)	-0.029 (0.020)	-0.021 (0.021)
Growth	0.136*** (0.020)	0.131*** (0.020)	0.139*** (0.020)	0.080*** (0.016)	0.069*** (0.016)	0.076*** (0.016)
Age=log(age+1)	-0.066** (0.030)	-0.052* (0.031)	-0.063** (0.031)	-0.028 (0.022)	-0.014 (0.024)	-0.017 (0.023)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3.570	3.570	3.570	3.570	3.570	3.570
R^2	0.081	0.063	0.071	0.032	0.041	0.031

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A6: France estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.092*** (0.017)			-0.045*** (0.016)		
Short term debt		0.022 (0.018)			0.007 (0.015)	
Total debt			-0.038** (0.019)			-0.015 (0.016)
Size=log(assets)	-0.069*** (0.018)	-0.073*** (0.018)	-0.072*** (0.018)	-0.010 (0.011)	-0.012 (0.011)	-0.012 (0.011)
Growth	0.140*** (0.012)	0.138*** (0.012)	0.141*** (0.013)	0.082*** (0.009)	0.080*** (0.009)	0.082*** (0.009)
Age=log(age+1)	-0.085*** (0.022)	-0.075*** (0.022)	-0.084*** (0.022)	-0.047*** (0.012)	-0.043*** (0.012)	-0.046*** (0.013)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15.085	15.085	15.085	15.085	15.085	15.085
R^2	0.050	0.040	0.049	0.029	0.025	0.027

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A7: Greece estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.052*** (0.013)			-0.026** (0.013)		
Short term debt		0.049*** (0.017)			0.041** (0.016)	
Total debt			0.012 (0.018)			0.023 (0.015)
Size=log(assets)	-0.084*** (0.026)	-0.101*** (0.025)	-0.103*** (0.026)	-0.052*** (0.016)	-0.060*** (0.016)	-0.065*** (0.018)
Growth	0.112*** (0.012	0.110*** (0.012)	0.112*** (0.012)	0.064*** (0.009)	0.062*** (0.009)	0.063*** (0.008)
Age=log(age+1)	0.017 (0.014)	0.022 (0.014)	0.019 (0.014)	-0.010 (0.015)	-0.006 (0.014)	-0.007 (0.014)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6.420	6.420	6.420	6.420	6.420	6.420
R^2	0.102	0.086	0.086	0.072	0.074	0.066

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A8: Italy estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.065*** (0.003)			-0.033*** (0.005)		
Short term debt		-0.012*** (0.004)			0.069*** (0.005)	
Total debt			-0.058*** (0.004)			0.050*** (0.004)
Size=log(assets)	-0.049*** (0.006)	-0.061*** (0.006)	-0.055*** (0.005)	-0.083*** (0.005)	-0.082*** (0.005)	-0.088*** (0.005)
Growth	0.088*** (0.002)	0.090*** (0.002)	0.093*** (0.002)	0.083*** (0.003)	0.077*** (0.003)	0.079*** (0.003)
Age=log(age+1)	-0.036*** (0.005)	-0.037*** (0.005)	-0.050*** (0.005)	-0.081*** (0.005)	-0.062*** (0.005)	-0.066*** (0.005)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	138.925	138.925	138.925	138.925	138.925	138.925
R^2	0.063	0.054	0.075	0.036	0.037	0.036

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A9: Portugal estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.048*** (0.007)			-0.037*** (0.007)		
Short term debt		0.010 (0.010)			0.013 (0.009)	
Total debt			-0.075*** (0.015)			-0.038*** (0.011)
Size=log(assets)	0.030* (0.016)	0.032* (0.016)	0.032** (0.016)	0.000 (0.009)	0.003 (0.009)	0.002 (0.009)
Growth	0.084*** (0.007)	0.085*** (0.007)	0.090*** (0.007)	0.071*** (0.009)	0.069*** (0.010)	0.074*** (0.009)
Age=log(age+1)	-0.081*** (0.012)	-0.073*** (0.013)	-0.092*** (0.013)	-0.065*** (0.008)	-0.059*** (0.008)	-0.069*** (0.008)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13.815	13.815	13.815	13.815	13.815	13.815
R^2	0.085	0.068	0.094	0.040	0.034	0.038

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration

Table A10: Sweden estimation

Variables	Performance measure: ROA			Performance measure: ROE		
Long term debt	-0.096*** (0.014)			-0.033** (0.015)		
Short term debt		0.080*** (0.25)			0.042 (0.034)	
Total debt			-0.045** (0.021)			-0.001 (0.026)
Size=log(assets)	-0.015 (0.024)	0.011 (0.024)	0.000 (0.023)	0.002 (0.025)	0.014 (0.025)	0.011 (0.027)
Growth	0.121*** (0.011)	0.118*** (0.011)	0.125*** (0.011)	0.083*** (0.010)	0.081*** (0.011)	0.083*** (0.011)
Age=log(age+1)	-0.031 (0.023)	-0.020 (0.024)	-0.026 (0.024)	0.010 (0.022)	0.014 (0.022)	0.013 (0.022)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10.860	10.860	10.860	10.860	10.860	10.860
R^2	0.076	0.050	0.065	0.029	0.026	0.026

Legend:*p<.1; **p<.05; ***p<.01; all continuous variables are standardized; all independent variables are lagged 1 year; robust standard errors in parentheses

Source: Own elaboration